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A Flow Through X-ray Absorption Spectroscopy Cell for Characterization of Powder Catalysts in the Working State

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Beamline: X11A

We report the design and demonstration of an X-ray absorption spectroscopy (XAS) cell, used for the characterization of solid (powder) catalysts in operation with gas-phase reactants. The use of powder samples removes complications arising from mass transfer limitations in pressed wafer samples, the typical form of catalyst used in other *in-situ* XAS cells. The new cell allows for collection of XAS data at temperatures ranging from about 230 to 470 K, gas flow rates ranging from about 10 to 500 mL min^{-1}, and pressures ranging from about 1 to 3 atm. The cell is designed to function nearly as a plug flow reactor.